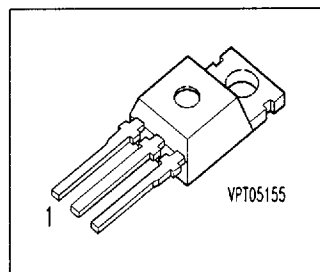


SIPMOS® Power Transistor

- N channel
- Enhancement mode
- Avalanche-rated



Pin 1	Pin 2	Pin 3
G	D	S

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Ordering Code
BUZ 73 A	200 V	5.5 A	0.6 Ω	TO-220 AB	C67078-S1317-A3

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current $T_C = 37\text{ }^\circ\text{C}$	I_D	5.5	A
Pulsed drain current $T_C = 25\text{ }^\circ\text{C}$	I_{Dpuls}	22	
Avalanche current, limited by T_{jmax}	I_{AR}	7	
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	6.5	mJ
Avalanche energy, single pulse $I_D = 7\text{ A}$, $V_{DD} = 50\text{ V}$, $R_{GS} = 25\text{ }\Omega$ $L = 3.67\text{ mH}$, $T_j = 25\text{ }^\circ\text{C}$	E_{AS}	120	
Gate source voltage	V_{GS}	± 20	V
Power dissipation $T_C = 25\text{ }^\circ\text{C}$	P_{tot}	40	W
Operating temperature	T_j	-55 ... + 150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip case	R_{thJC}	≤ 3.1	K/W
Thermal resistance, chip to ambient	R_{thJA}	75	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

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Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Drain- source breakdown voltage $V_{GS} = 0\text{ V}$, $I_D = 0.25\text{ mA}$, $T_j = 25^\circ\text{C}$	$V_{(BR)DSS}$	200	-	-	V
Gate threshold voltage $V_{GS} = V_{DS}$, $I_D = 1\text{ mA}$	$V_{GS(th)}$	2.1	3	4	
Zero gate voltage drain current $V_{DS} = 200\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = 25^\circ\text{C}$ $V_{DS} = 200\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = 125^\circ\text{C}$	I_{DSS}	- -	0.1 10	1 100	μA
Gate-source leakage current $V_{GS} = 20\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	-	10	100	
Drain-Source on-resistance $V_{GS} = 10\text{ V}$, $I_D = 4.5\text{ A}$	$R_{DS(on)}$	-	0.5	0.6	Ω

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Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Dynamic Characteristics

Transconductance $V_{DS} \geq 2 \cdot I_D \cdot R_{DS(on)max}$, $I_D = 4.5\text{ A}$	g_{fs}	3	4.2	-	S
Input capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{iss}	-	400	530	pF
Output capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{oss}	-	85	130	
Reverse transfer capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{rss}	-	45	70	
Turn-on delay time $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	$t_{d(on)}$	-	10	15	ns
Rise time $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	t_r	-	40	60	
Turn-off delay time $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	$t_{d(off)}$	-	55	75	
Fall time $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	t_f	-	30	40	

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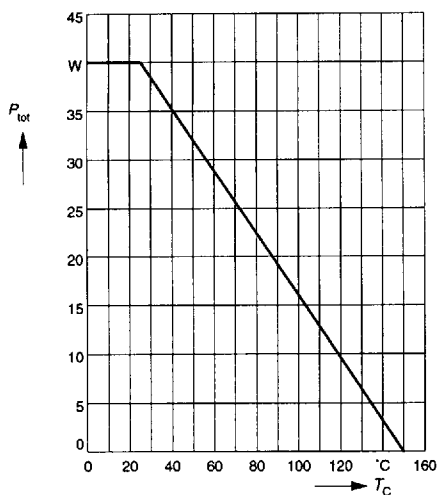
Electrical Characteristics, at $T_J = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Inverse diode continuous forward current $T_C = 25\text{ }^{\circ}\text{C}$	I_S	-	-	5.5	A
Inverse diode direct current,pulsed $T_C = 25\text{ }^{\circ}\text{C}$	I_{SM}	-	-	22	
Inverse diode forward voltage $V_{GS} = 0\text{ V}$, $I_F = 14\text{ A}$	V_{SD}	-	1.3	1.7	V
Reverse recovery time $V_R = 100\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	200	-	ns
Reverse recovery charge $V_R = 100\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	0.6	-	μC

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Power dissipation

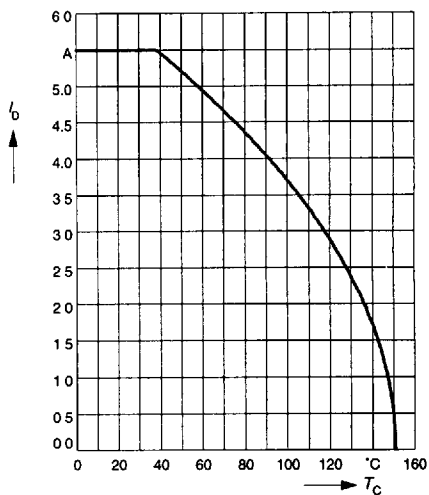
$$P_{\text{tot}} = f(T_C)$$



Drain current

$$I_D = f(T_C)$$

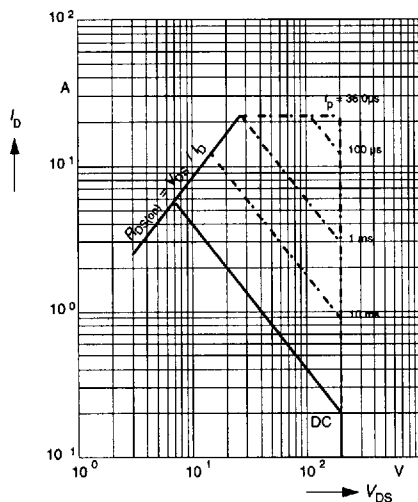
parameter: $V_{GS} \geq 10 \text{ V}$



Safe operating area

$$I_D = f(V_{DS})$$

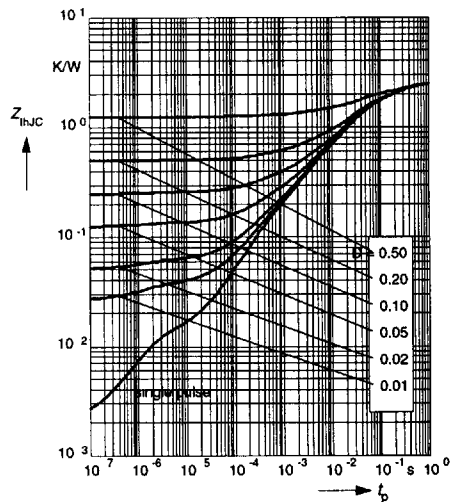
parameter: $D = 0.01$, $T_C = 25^\circ\text{C}$



Transient thermal impedance

$$Z_{\text{th JC}} = f(t_p)$$

parameter: $D = t_p / T$

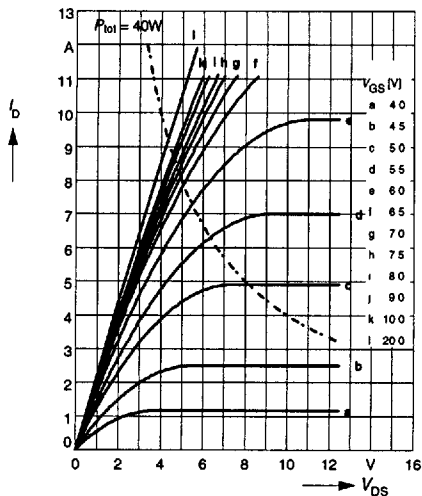


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Typ. output characteristics

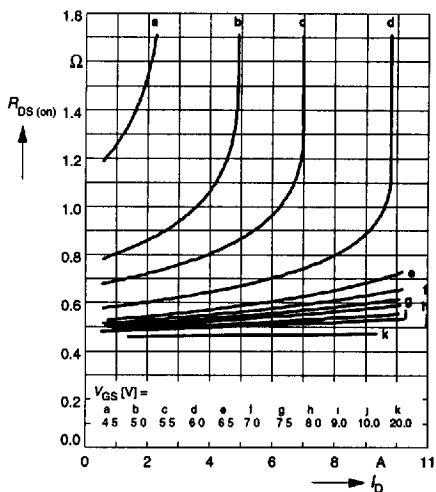
$$I_D = f(V_{DS})$$

parameter: $t_p = 80 \mu s$


Typ. drain-source on-resistance

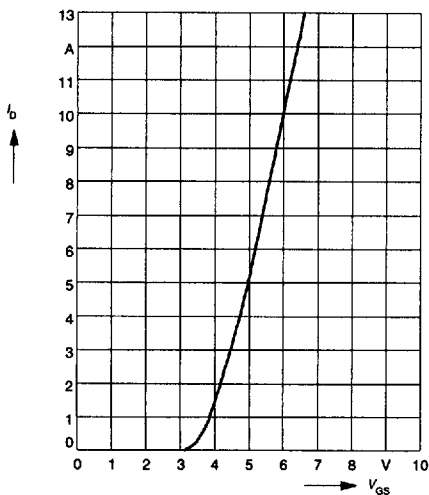
$$R_{DS(on)} = f(I_D)$$

parameter: V_{GS}


Typ. transfer characteristics $I_D = f(V_{GS})$

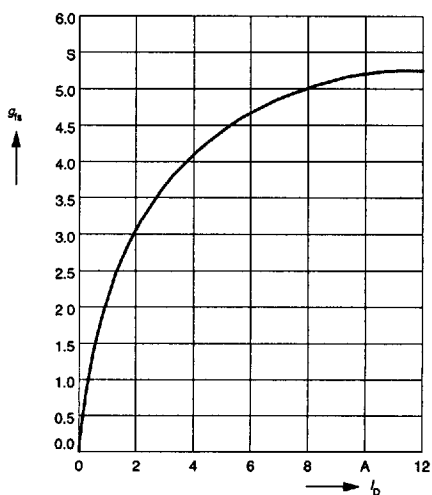
parameter: $t_p = 80 \mu s$

$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$


Typ. forward transconductance $g_{fs} = f(I_D)$

parameter: $t_p = 80 \mu s$,

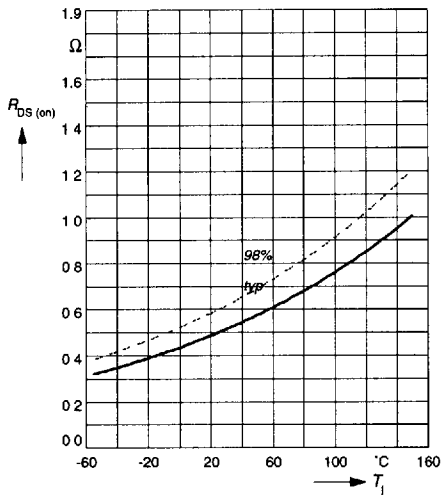
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

$$R_{DS(on)} = f(T_J)$$

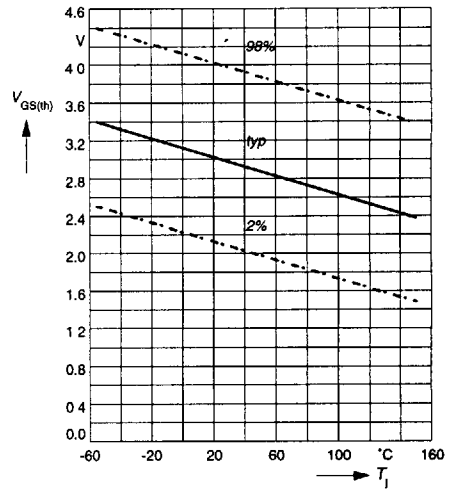
parameter: $I_D = 4.5 \text{ A}$, $V_{GS} = 10 \text{ V}$



Gate threshold voltage

$$V_{GS(th)} = f(T_J)$$

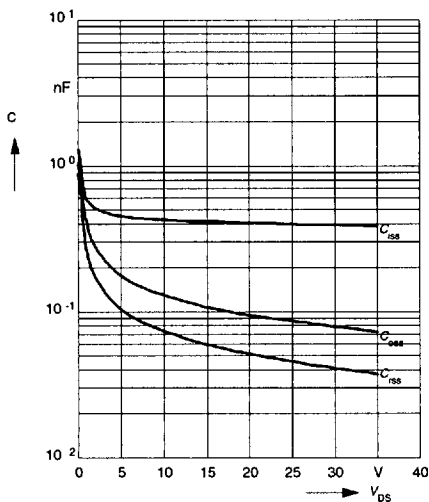
parameter: $V_{GS} = V_{DS}$, $I_D = 1 \text{ mA}$



Typ. capacitances

$$C = f(V_{DS})$$

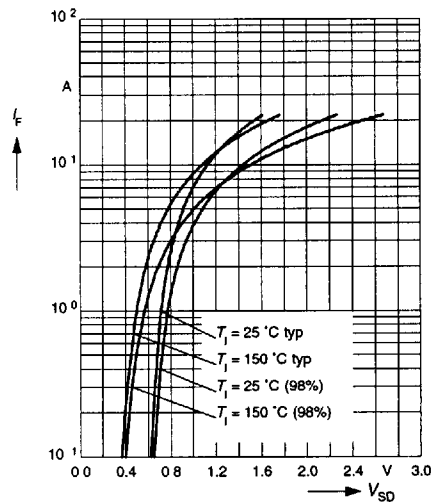
parameter: $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$



Forward characteristics of reverse diode

$$I_F = f(V_{SD})$$

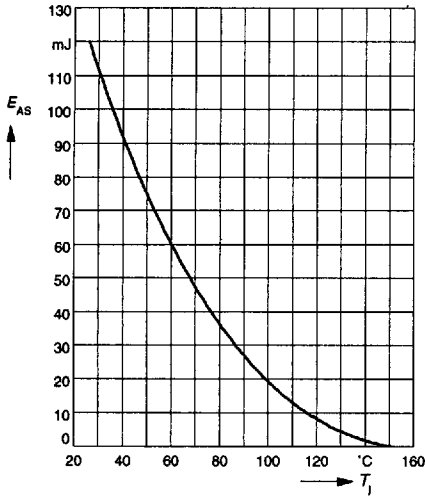
parameter: T_J , $t_p = 80 \mu\text{s}$



Avalanche energy $E_{AS} = f(T_j)$

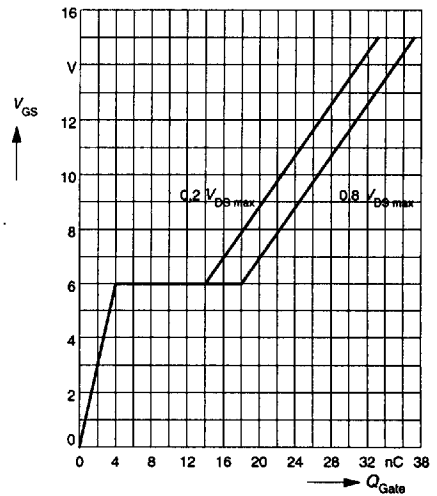
parameter: $I_D = 7\text{ A}$, $V_{DD} = 50\text{ V}$

$R_{GS} = 25\ \Omega$, $L = 3.67\text{ mH}$

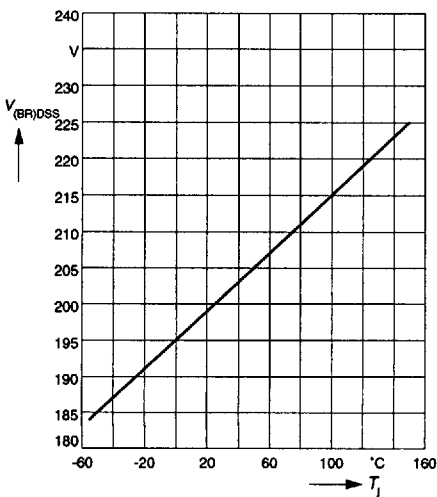

Typ. gate charge

$V_{GS} = f(Q_{Gate})$

parameter: $I_{D\text{ puls}} = 14\text{ A}$


Drain-source breakdown voltage

$V_{(BR)DSS} = f(T_j)$



Gehäusemaßbilder

(Maße in mm, wenn nicht anders angegeben)

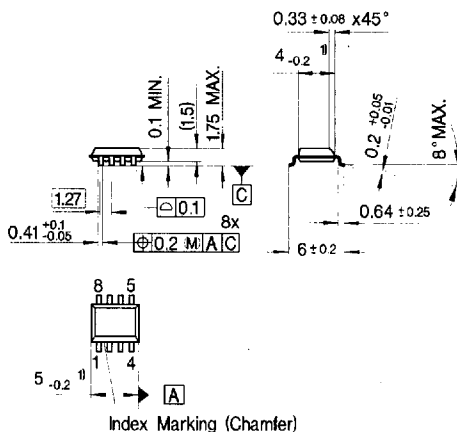
Package Outlines

(Dimensions in mm, unless otherwise specified)

P-DSO-8-6/-7

Gewicht etwa 0.15 g

Approx. weight 0.15 g



1) Does not include plastic or metal protrusion of 0.15 max. per side

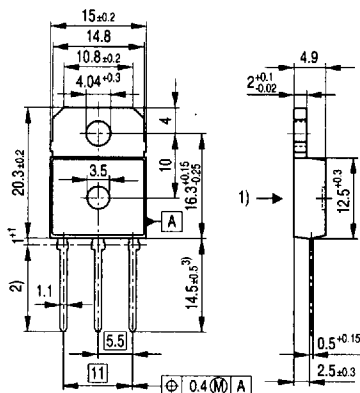
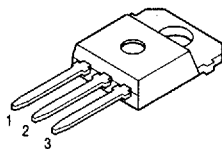
Bild 16

Figure 16

P-T0218-AA (P-T0218-2-1)

Gewicht etwa 4.9 g

Approx. weight 4.9 g



- 1) Punch direction, burr max. 0.04
- 2) Dip tinning
- 3) Max. 15.5 by dip tinning
press burr max. 0.05
radii not dimensioned max. 0.2

GPT05156

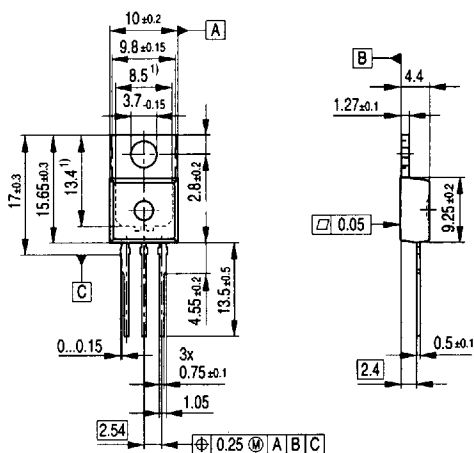
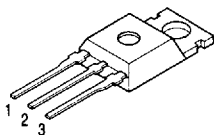
Bild 17

Figure 17

P-T0220-3-1

Gewicht etwa 1.8 g

Approx. weight 1.8 g

¹⁾ Typical

All metal surfaces tin plated, except area of cut.

GPT05155

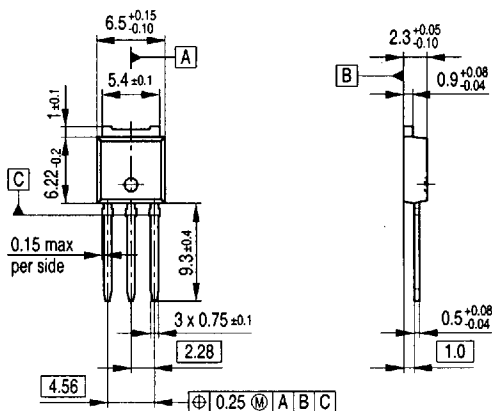
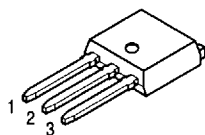
Bild 18

Figure 18

P-T0251-3-1

Gewicht etwa 2.0 g

Approx. weight 2.0 g



All metal surfaces tin plated, except area of cut.

GPT09050

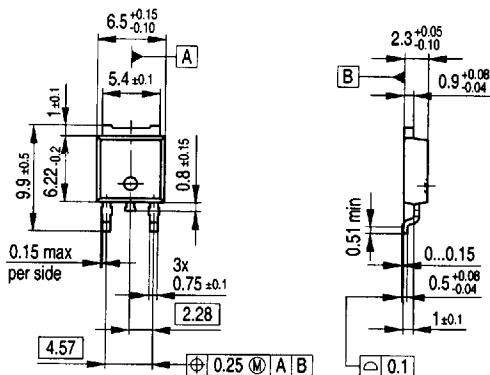
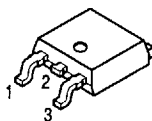
Bild 19

Figure 19

P-TO252-3-1

Gewicht etwa 0.38 g

Approx. weight 0.38 g



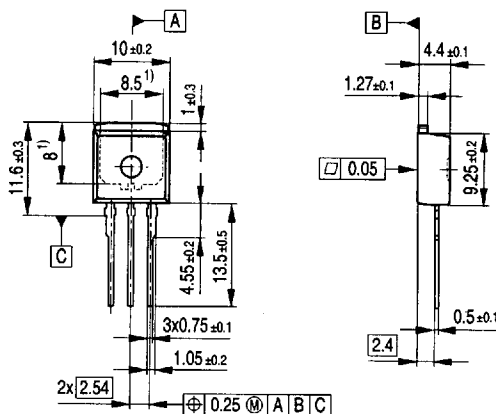
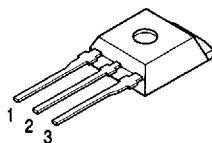
All metal surfaces tin plated, except area of cut.

GPT09051

Bild 20

Figure 20

P-TO262-3-1/I²PAK



¹⁾ Typical

Metal surface min. X = 7.25, Y = 7.35

All metal surfaces tin plated, except area of cut.

GPT09244

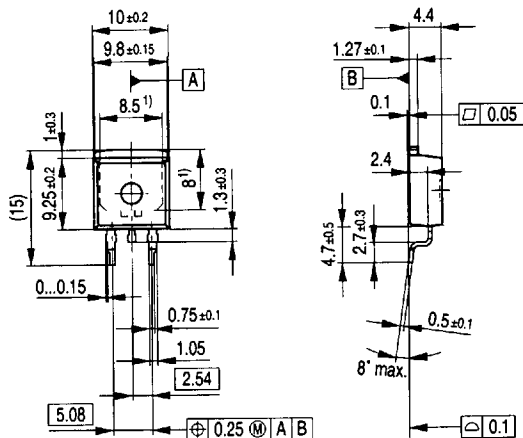
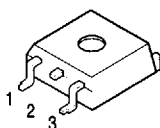
Bild 21

Figure 21

P-TO263-3-2/D²PAK

Gewicht etwa 1.38 g

Approx. weight 1.38 g



¹⁾ Typical

All metal surfaces tin plated, except area of cut.

GPT09085

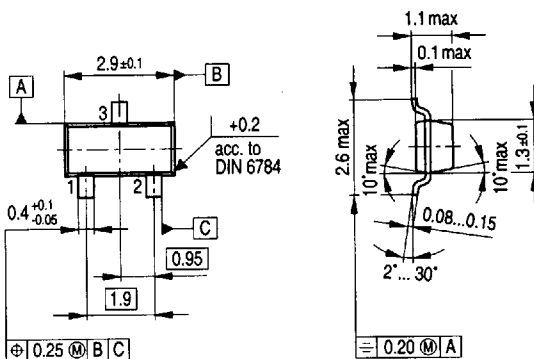
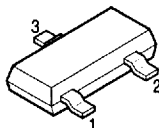
Bild 22

Figure 22

SOT-23 (P-SOT23-3-1)

Gewicht etwa 0.01 g

Approx. weight 0.01 g



GPS05557

Bild 23

Figure 23

SOT-89

Gewicht etwa 0.01 g

Approx. weight 0.01 g

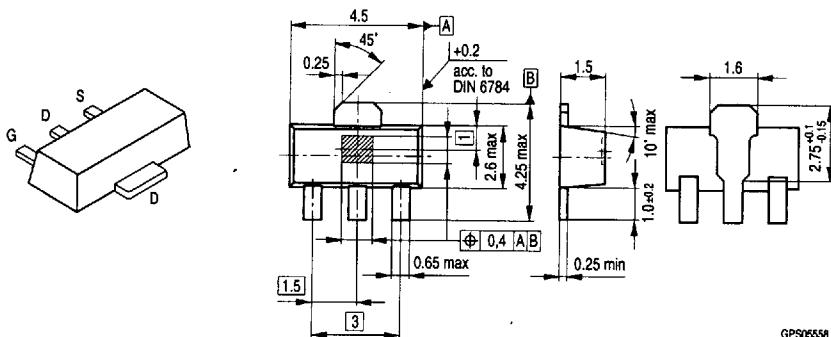


Bild 24

Figure 24

SOT-223 (P-SOT223-4-1)

Gewicht etwa 0.15 g

Approx. weight 0.15 g

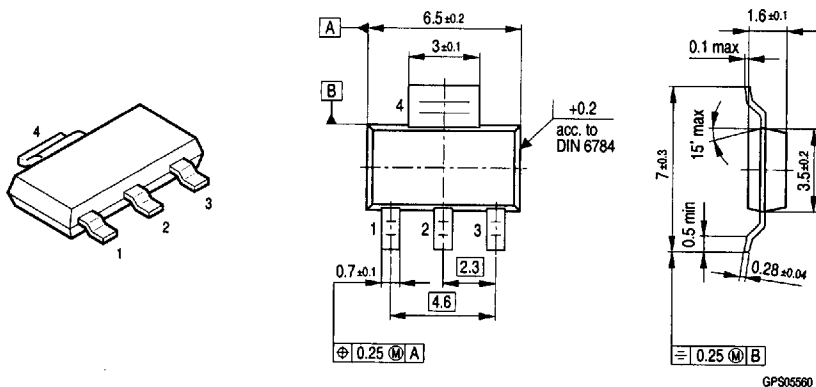


Bild 25

Figure 25

TO-92

Gewicht etwa 0.23 g

Approx. weight 0.23 g

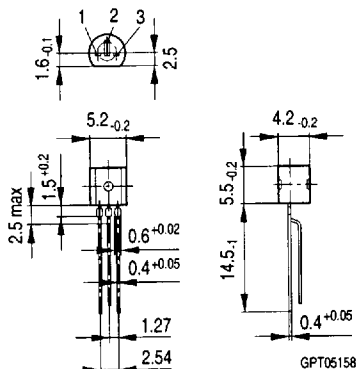
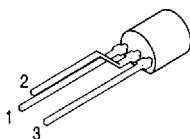


Bild 26

Figure 26

TO-92-E6288

Gewicht etwa 0.23 g

Approx. weight 0.23 g

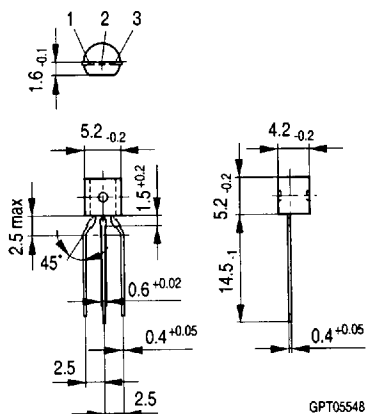
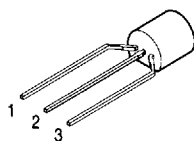


Bild 27

Figure 27

Sorts of Packing

Package outlines for tubes, trays etc. are contained in our Data Book "Package Information".

SMD = Surface Mounted Device